




Visual Models for Fractions: Day 2

Math & Science Collaborative

July 9-11, 2013



**What are some of the things
that are sticking with you
from yesterday?**

Discussion of Readings

- Chapter 2 in *Beyond Pizzas and Pies*
 - How is it that the first three student explanations provided for this probe (in the boxes on pp. 20-21) are actually giving a correct explanation for the answer they did NOT choose?
 - In what ways did a subset of the students who chose $\frac{7}{8}$ as the larger fraction lack understanding, even though they chose the correct answer?

Discussion of Readings

- Chapter 3 in *Beyond Pizzas and Pies*
 - Can you think of anything that you may have inadvertently done in the past akin to what Ms. Chu realized in the last paragraph on p. 33?

Submarine Sandwiches

- Read
 - Approaches to Solving a Fair Share Problem
 - Conferring with Students at Work
- View the rest of the congress
- Take a couple of minutes to examine the 4th grade content standards for Fractions

Read 4th grade standards

- Jigsaw the unpacked standards and the Progression

Submarine Sandwiches

- Which of the 4th grade content standards do you see operating, or potentially operating, within the Submarine Sandwich Task?
 - Consider your own solution strategies as well as those of the students that are in your binder and the students in the classroom reading and video episode

Three - Fourths

- One of the fractional pieces of the sub was $\frac{3}{4}$ of a submarine sandwich
- Brainstorm other ways that you might think about the number $\frac{3}{4}$

Fundamental Types of Models

1. Linear Models

- Typically modeled with tools such as number lines or Cuisenaire rods

2. Area Models

- Modeled with tools such as rectangular fraction bars, fraction circles or pattern blocks

3. Discrete Models

- Include any model viewed as a group of objects like the children in the classroom or the cars in the lot
- Each object in the group is typically modeled by some type of counter

p.49 of *Putting Essential Understandings
of Fractions into Practice 3-5*

Three-fourths Activity

- Think about each situation
- Draw a visual model to represent the meaning of $\frac{3}{4}$ in the situation
- Which one(s) use the typical pizza model that we seem to default to when modeling with student?

Three-fourths Activity (cont.)

- Choose one number from the list
- Write at least one example of each type of representation from that fraction
- Choose one representation type
- Write a problem that is a comparison problem and...
- Write a problem that is an addition or subtraction problem using your fraction and your representation type

Capture Fractions - Revisited

- This time, we will play the game as the directions tell us to play.
- Keep track of the thinking you are using while playing the game.
- Use the tracking sheet to record any models or thoughts about the comparison

Debriefing the Game

- Comparing Fractions
 - Note the 3rd to 4th grade change in this standard
 - How is this change in the standard reflected in the playing of the game?


Fraction Equivalence

These are words we often use to describe a relationship among fractions

Equivalent	Equal	Same
$\frac{3}{4}$ and $\frac{6}{8}$ are equivalent	$\frac{3}{4} = \frac{6}{8}$	Three-fourths is the same as $\frac{6}{8}$

How are these statements different? The same?

What implications might they have for student thinking about fraction relationships?



“Many teachers seem to believe that fraction answer are incorrect if not in simplest of lowest terms. This is unfortunate.” (Van de Walle)

Decimal Fractions

- Task on pp. 83-85 of *Putting Essential Understandings of Fractions into Practice* (Fig. 5.2 and 5.4)
- Shade 0.6 of the grid that is provided
- Write several fractions that could be used to represent the shaded portion

Let's Get Up

- Creating a human number line
 - Each person gets a number between 0 and 1
 - Find your location on the number line, given the location of 0 and the location of 1
 - Check with those near you to make sure both you and they are placed correctly. Make any corrections, as needed
 - Make sure to have at least one (and preferably 2 or 3) explanation(s) as to why the location you picked is correct

Decimal Fractions

Common Misconceptions

1. Longer is larger
2. Zeros can be ignored
3. The decimal equals a sort of “reciprocal”

Puppy Snack Mix

- Maria sells gourmet puppy snack mix that blends crunchies, nuggets and chopped meat. Here is her recipe:
 - $\frac{3}{4}$ cup crunchies
 - $\frac{1}{2}$ cup nuggets
 - $\frac{1}{4}$ cup chopped meat
- How many cups of puppy mix? Use visual model of your choosing to find out.

Addition and Subtraction with Fractions

Strategies students often use

- Direct Modeling
- Counting On
- Derived Facts

Addition and Subtraction with Fractions

- Recall the four basic classes of addition and subtraction problems
- See the table of Common Addition and Subtraction Situations in your binder.
 - Note that this is part of the Common Core Standards, but it is in the Glossary portion and not “up front” with the actual standards

Addition and Subtraction with Fractions

Johanna needs $3 \frac{1}{2}$ cups of flour for a cake.

She only has $2 \frac{1}{4}$ cups of flour.

How much more flour does Johanna need to make the cake?

Sharing Brownies or Adding Fractions

- MaryAnn's Case in Making Meaning of Operation
 - Study Maribel's solutions. Explain her method. What ideas about adding fraction can you see in her work? What appears to be missing?
 - What about Alejandro's solutions. What ideas can you see? What appears to be missing?
 - Study Jackson's work. What ideas about fraction addition can you see? What is missing?

Joey's Run

- Maya runs $\frac{1}{2}$ mile each day for 12 days.
How many miles does Maya run in all?
- K.C runs $\frac{1}{4}$ mile each day for 12 days.
How many miles does K.C. run in all?
- Joey runs $\frac{3}{4}$ mile each day for 12 days.
How many miles does Joey run in all?

Revisiting the Standards for Math Practice

- Which SMPs did you see in play in the series of problems and the videotaped episode dealing with Joey's run?
- Give evidence to support your answer.

Read 4th grade standards

- Jigsaw the unpacked standards and the Progression

Homework

- Rest of chapter 2 in *Putting Essential Understanding of Fractions into Practice*
- *Faith's Case* that is in your binder (copied from *Making Meaning of Operations*)
- Focus on one Content Standard combined with one SMP and plan how to implement one idea or variation of it from today in your class